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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,120	06/03/2005	Hiroshi Koyama	3273-0203PUS1	1266
2292 7590 10/09/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER BERNSHTEYN, MICHAEL	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 10/09/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

## Office Action Summary

**Application No.**

10/537,120

**Applicant(s)**

KOYAMA ET AL.

**Examiner**

Michael Bernshteyn

**Art Unit**

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 4-6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____                                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/03/2005</u> .  | 6) <input type="checkbox"/> Other: ____                           |

## DETAILED ACTION

### *Claim Objections*

1. Claim 4 is objected to because of the following informalities: the claim recites "a first poison" instead of obvious "a first position". Appropriate correction is required.
2. Claims 5 and 6 are objected to because of the following informalities: improper Markush group format. According MPEP § 2171.05(h), one acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being "selected **from the group consisting of** A, B and C." See *Ex parte Markush*, 1925 C.D. 126 (Comm'r Pat. 1925). Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

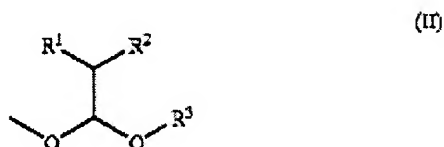
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu et al. (WO 03/006407). The U.S. Patent 7,015,363 is equivalent to the WO 03/006407; therefore, the following rejection is based upon the context of U.S. Patent 7,015,363.

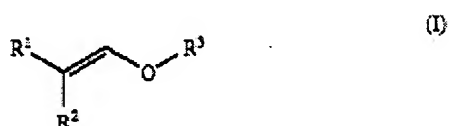
With regard to the limitation of instant claims 1-3, Shimizu discloses a process for producing of an ether compound, which is useful for chemical amplification type **resist compositions**, synthetic intermediates of pharmaceuticals, paints, or the like, with less

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side reaction and in high yield. A process for producing an ether compound having a group represented by the general formula (II)



wherein  $R^1$ ,  $R^2$  and  $R^3$  may be the same or different, and represent substituted or unsubstituted alkyl, substituted or unsubstituted aryl or substituted or unsubstituted aralkyl, or  $R^1$  and  $R^2$  form cycloalkyl together with an adjacent carbon atom, which comprises allowing a compound having a hydroxyl group (including a **carboxyl group**) to react with an **alkenyl ether** represented by the general formula (I)

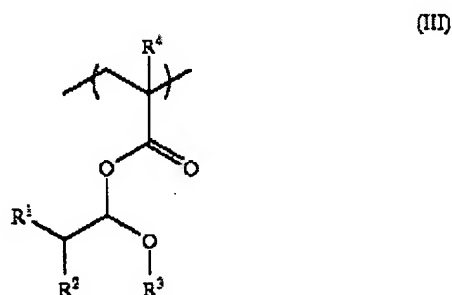


wherein  $R^1$ ,  $R^2$  and  $R^3$  have the same significances as defined above, respectively (abstract).

Furthermore, Shimizu discloses that synthesis of a hemiacetal ester was studied in Journal of Adhesion Society of Japan, vol. 34, p. 246 (1998), in which a reaction between straight chain alkyl vinyl ether and a compound having a carboxyl group was performed in the presence of various kinds of acids (col. 1, lines 44-48).

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With regard to the limitation of instant claims 4-6, Shimizu discloses the chemical amplification type resist composition wherein the ether compound having a group represented by the general formula (II) is a vinyl polymer having a structural unit represented by the general formula (III):



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> have the same significances as defined above, respectively, and R<sup>4</sup> represents a hydrogen atom or lower alkyl (col. 4, lines 13-32).

The polymers of formulas (I-III) are substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I).

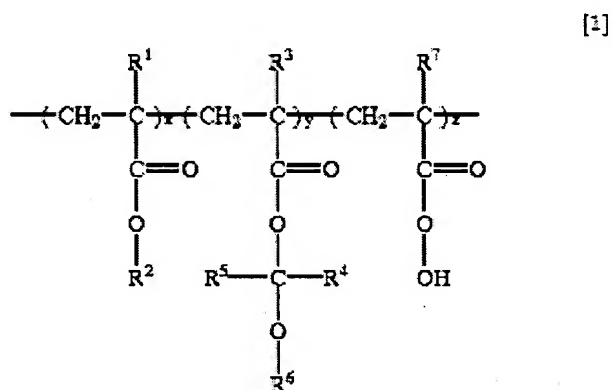
With regard to the limitation of instant claim 7, Shimizu discloses a chemical amplification type resist composition comprising an ether compound, and a photo acid generating agent (col. 3, line 65 through col. 4, line 12).

With regard to the limitation of instant claim 8, Shimizu exemplifies a process of forming a pattern comprising steps of coating a photoresist resin composition on a base or substrate to form a resist film (col. 8, line 53 through col. 9, line 10).

4. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwasa et al. (U. S. Patent 5,994,025).

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With regard to the limitation of instant claims 1-7, Iwasa discloses a **photoresist** including (a) a resin composed of a polymer represented with the following general formula [1], and (b) a **photoacid generator**, which produces acid when exposed to a light:



wherein each of  $R^1$ ,  $R^3$  and  $R^7$  represents one of a hydrogen atom and a methyl group,  $R^2$  represents a hydrocarbon group including a bridged cyclic hydrocarbon group and having a carbon number in the range of 7 to 13 both inclusive,  $R^4$  represents one of a hydrogen atom and a hydrocarbon group having a carbon number of 1 or 2,  $R^5$  represents a hydrocarbon group having a carbon number of 1 or 2,  $R^6$  represents one of (a) a hydrocarbon group having a carbon number in the range of 1 to 12 both inclusive, (b) a hydrocarbon group having a carbon number in the range of 1 to 12 both inclusive and replaced with an alkoxy group having a carbon number in the range of 1 to 12 both inclusive, and (c) a hydrocarbon group having a carbon number in the range of 1 to 12 both inclusive and replaced with an acyl group having a carbon number in the range of 1 to 13 both inclusive,  $x+y+z=1$ ,  $x$  is in the range of 0.1 to 0.9,  $y$  is in the range of 0.1 to 0.7, and  $z$  is in the range of 0 to 0.7. The resin has a weight percent in the range of 75 to 99.8 both inclusive, and the photo acid generator has a weight percent in the range of 0.2 to 25 both inclusive. The

The above-mentioned photoresist produces no extra polymer by side reaction. Thus, the photoresist has high resolution to thereby make it possible to form a fine pattern without resist residue (abstract).

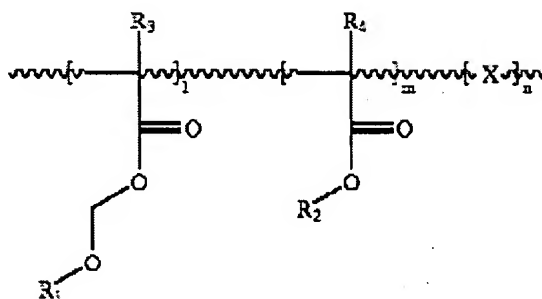
The polymer of formula [1] is substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I).

With regard to the limitation of instant claim 8, Iwasa discloses a method of patterning a photoresist, including the steps of (a) applying a photoresist on a substrate, (b) exposing the photoresist to a light having a wavelength smaller than 400 nanometers, and (c) developing the photoresist to thereby form a resist pattern. Herein, the photoresist includes (a) a resin composed of a polymer represented with the above-mentioned general formula [1], and (b) a photo acid generator, which produces acid when exposed to a light (col. 7, lines 50-58).

5. Claims 4-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al. (U. S. Patent Application Publication 2002/0177068).

With regard to the limitation of instant claims 4-6, Park discloses a polymer for use in a chemically amplified resist, the polymer being represented by the following formula I.

Formula 1



[0012] where  $R_1$  is an alkyl group having 1 to 30 carbon atoms;  $R_2$  is hydrogen or an alkyl group having 1 to 30 carbon atoms;  $R_3$  and  $R_4$  are independently hydrogen or a methyl group; X is vinyl ether derivative, styrene derivative or olefin derivative; and 1, m and n are a repeat unit of the polymer, wherein 1 is 0.05 to 0.9, m is 0 to 0.7, and n is 0 to 0.7.

The polymer of formula 1 is substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I).

With regard to the limitation of instant claim 7, Park discloses a chemically amplified resist composition comprising a copolymer of at least one polymer represented by the above-mentioned formula I, a **photoacid generator**, an additive, and a solvent (Claim 3, page 5).

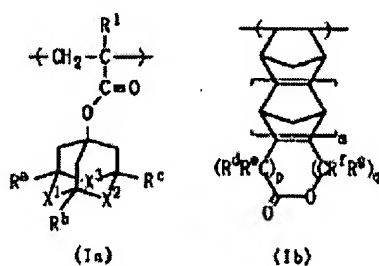
With regard to the limitation of instant claim 8, Park discloses a patterning method comprising exposing the chemically amplified resist composition containing a copolymer of at least one polymer represented by the above-mentioned formula I using a radiation selected from ultraviolet (UV), X-ray or electron beam (claim 9, page 6).

6. Claims 4-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Gokochi et al. (JP 2001-240625).



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With regard to the limitation of instant claims 4-6, Gokochi discloses a polymer compound for **photoresist** comprising at least one species of monomer units expressed from formula (Ia) and (Ib)

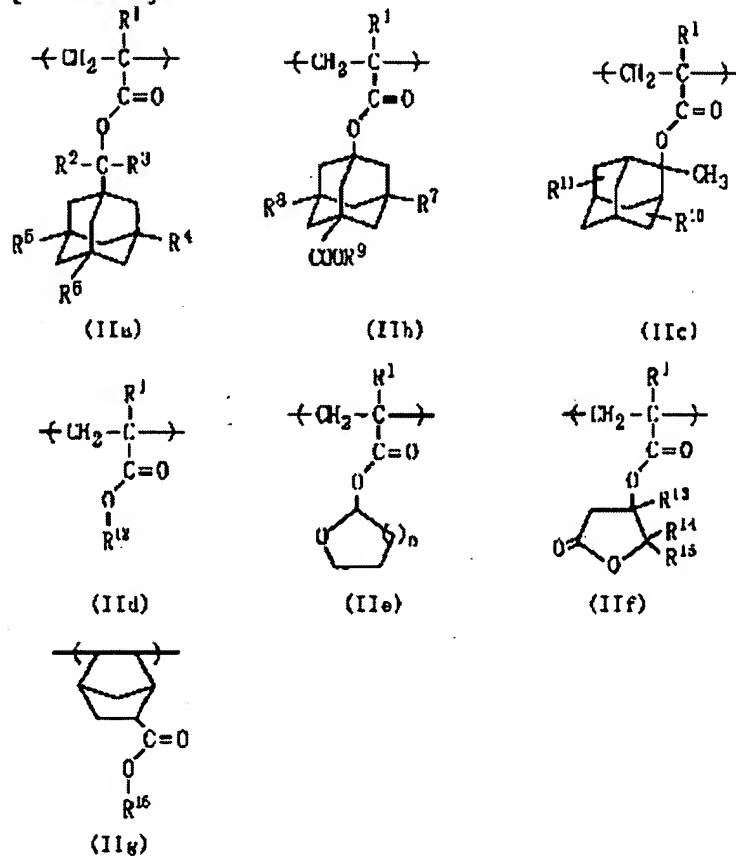


wherein  $R_1$ ,  $R_a$ ,  $R_b$ ,  $R_c$ ,  $R_d$ ,  $R_e$ ,  $R_f$  and  $R_g$  are each the same or different and express H or methyl;  $X_1$ ,  $X_2$  and  $X_3$  are each express  $-\text{CH}_2-$  or  $-\text{CO}-\text{O}$  and at least one of them expresses  $-\text{CO}-\text{O}-$ ;  $m$ ,  $p$  and  $q$  are each an integer or 0-2 (abstract)

Gokochi discloses that at least one sort of monomeric units chosen from the monomeric unit expressed with a formula (Ia) and (Ib), and following formula (IIa) - (IIg) (claim 2):

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[Formula 2]



R<sub>1</sub> is a hydrogen atom or a methyl group among a formula; R<sub>2</sub> and R<sub>3</sub> are the same or different; the hydrocarbon group of carbon numbers 1-8; R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> are the same or different and a hydrogen atom, hydroxyl, or a methyl group; R<sub>7</sub> and R<sub>8</sub> are the same or different, a hydrogen atom, hydroxyl, or nine -COOR(s) are shown; R<sub>9</sub> is t-butyl, 2-tetrahydrofuranyl radical, 2-tetrahydropyranyl group, or 2-oxepanyl radical; R<sub>10</sub> and R<sub>11</sub> are the same or different and a hydrogen atom, hydroxyl, or an oxo-radical is shown; R<sub>12</sub> is hydrocarbon group, which has a tertiary carbon atom in a binding site with the oxygen atom shown in a formula; R<sub>13</sub>, R<sub>14</sub>, and R<sub>15</sub> are the same or different and a hydrogen atom or a methyl group is shown; R<sub>16</sub> is shows t-butyl, 2-tetrahydrofuranyl

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radical, 2-tetrahydropyranyl group, or 2-oxepanyl radical; n is a high molecular compound for photoresists including at least one sort of monomeric units chosen from the integer of 1-3 (claim 2).

The polymers of formula (1a) and 2 are substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I).

With regard to the limitation of instant claims 7-8, Gokochi discloses a polymer compound for photoresist, which is excellent in adhesiveness to a substrate and capable of forming fine patterns in good accuracy (abstract).

7. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Douki et al. (JP 2001-188346).

With regard to the limitation of instant claims 1-8, Douki discloses a radiation sensitive resin composition comprising (A) an alkali-insoluble or slightly alkali-soluble acid-dissociable group-containing resin having a skeleton of formula 1, preferably as a group of formula 2-1 or 2-2 and convertible to an alkali-soluble resin when the acid-dissociable group is dissociated and (B) a radiation sensitive acid **generating agent**. The component A is typified by a copolymer comprising repeating units of formula 3.

The radiation sensitive resin composition has high transparency to radiation as a chemical amplification type resist, excellent in basic physical properties as a resist such as dry etching resistance, sensitivity, resolution and **pattern shape**, not causing development defects in microfabrication and capable of producing a **semiconductor device** in high yield (abstract).

Douki discloses several monomers used for the preparation of polymers having formulas (1)-(9), which are substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I) (Claims 1-5, pages 1-4).

8. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato (JP 2000-187327).

With regard to the limitation of instant claims 1-8, Sato discloses a positive photosensitive for far ultraviolet exposure comprising a compound generating an acid by the irradiation with active light or radiation, a resin containing an alkali soluble group protected by at least one of a partial structure containing an alicyclic hydrocarbon expressed by formulas I-VI and capable of degrading with the acid to increase the solubility to an alkali and a low molecular compound having a hydrophilic functional group and the alicyclic hydrocarbon group or a naphthalene compound having a hydrophilic functional group. The positive photoresist composition has excellent sensitivity to short wavelength light source by using a specific acid degradable resin and a specific additive (abstract).

Sato discloses several monomers used for the preparation of polymers having formulas (I-VI), which are substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I) (Claims 1-2, pages 1-2).

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**Conclusion**


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Bernshteyn  
Patent Examiner  
Art Unit 1713

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09/28/2007

  
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